Aviation Investigation Final Report

Location:	Ravenna, Ohio	**Accident Number:**	CEN18FA045
Date & Time:	December 3, 2017, 11:40 Local	**Registration:**	N2200T
Aircraft:	Piper TITAN TORNADO II D	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The sport pilot of the experimental, amateur-built airplane was returning to the airport after a 30-minute flight. A witness saw the airplane on final approach to the runway about 500 ft above ground level when he heard a total loss of engine power. The airplane banked left and right and entered a nose-down descent consistent with an aerodynamic stall condition. The airplane impacted terrain short of the runway.

Although the witness, an acquaintance of the accident pilot, estimated that the pilot had accrued about 10 hours of flight time in the airplane since purchasing it about 1 year prior, the pilot's logbook was not located during the investigation, and his experience level in the accident airplane could not be determined. Additionally, it could not be determined if the pilot had obtained transition training in the accident airplane, which was classified as a low-inertia/high-drag airplane. Low-inertia/high-drag airplanes rapidly lose energy (airspeed and/or altitude) when there is a loss or reduction of power, and are particularly susceptible to unintentional aerodynamic stalls due to their low cruise speed to stall speed margin and their tendency to experience significant airspeed decay with increased load factor (such as during a turn).

Examination of the airplane and engine revealed no mechanical anomalies that would have precluded normal operation; therefore, the reason for the loss of engine power could not be determined. It is likely that the pilot failed to attain a proper airspeed following the loss of engine power, which resulted in an exceedance of the airplane's critical angle of attack, an aerodynamic stall, and impact with terrain.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's failure to maintain adequate airspeed following a loss of engine power during final approach for landing, which resulted in an exceedance of the airplane's critical angle of attack and an aerodynamic stall.

Findings

Aircraft	Angle of attack - Attain/maintain not possible
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Approach-VFR pattern final	Loss of engine power (total)
Approach-VFR pattern final	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On December 3, 2017, at 1140 eastern standard time, an experimental, amateur-built Titan Tornado II D, N2200T, impacted terrain while on final approach for landing at Portage County Airport (POV), Ravenna, Ohio. The sport pilot sustained fatal injuries, and the airplane was destroyed by impact forces. The airplane was owned by the pilot who was operating it as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed for the flight, which departed from POV about 1110.

The only witness to the accident stated that the pilot stopped by the witness's hangar before the accident flight and said that it was a beautiful day to go flying. The witness saw the airplane take off from runway 27 and described the takeoff as "Learjet style," meaning that the airplane had a high rate of climb. The airplane proceeded south until it disappeared from his view. The witness subsequently saw the accident airplane on final approach for runway 27 about 30 minutes later. While on final approach, the airplane was "coming down normally and regularly" before he heard the engine noise "suddenly stop" and the engine went "silent." About 10 seconds later and about 1 mile from the approach end of runway 27, the airplane started "acting erratically." The airplane banked right, then banked immediately left, and then banked right before descending from about 500 ft above ground level into the ground. The witness stated that the airplane "didn't go straight down," but it was a "steep" descent.

Pilot Information

Certificate:	Sport Pilot	**Age:**	60,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Sport pilot Without waivers/limitations	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

The pilot held a sport pilot certificate. He also held repairman-experimental aircraft builder and repairman-light sport aircraft certificates. The pilot's logbook was not available for review. The pilot did not hold an FAA airman medical certificate, nor was he required to as a sport pilot.

Aircraft registration records showed that the pilot purchased the airplane on September 10, 2016.The witness estimated that the pilot had accumulated about 10 hours in the airplane since purchasing it.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N2200T
Model/Series:	TITAN TORNADO II D	**Aircraft Category:**	Airplane
Year of Manufacture:	2017	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	002
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	February 6, 2017 Condition	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	as of last inspection	**Engine Manufacturer:**	Jabiru
ELT:		**Engine Model/Series:**	2200
Registered Owner:	Individual	**Rated Power:**	85 Horsepower
Operator:	Pilot	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	POV,1198 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	11:33 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	6°C / 0°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ravenna, OH (POV)	**Type of Flight Plan Filed:**	None
Destination:	Ravenna, OH (POV)	**Type of Clearance:**	None
Departure Time:	11:10 Local	**Type of Airspace:**	

Airport Information

Airport:	Portage County Airport POV	**Runway Surface Type:**	Asphalt
Airport Elevation:	1198 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	27	**IFR Approach:**	None
Runway Length/Width:	3499 ft / 75 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	41.20861,-81.228332(est)

The wreckage was located behind a house about 0.8 mile east of runway 27. The area surrounding the wreckage displayed ground scarring consistent with the dimensions of the airplane. The airplane was oriented in a nose-down attitude. The wings, elevators, and rudder and their respective controls surfaces were attached and secure. The propeller was attached and secure to the engine, which remained attached to the airframe. Neither of the two propeller blades displayed damage. There was no evidence of fire or sooting. The instrument panel was destroyed by impact forces.

Flight control continuity was established from the flight control surfaces to the cockpit controls. Engine control continuity from the cockpit controls to the engine was confirmed.

The 15-gallon fuel tank contained an estimated 1 gallon of liquid consistent with fuel. The fuel did not exhibit contamination. The fuel valves from the fuel tank to the engine were in the open position.

The airplane was equipped with an Adventure Pilot iFly 720 multi-function display and GPS unit with removable SD card; a MGL RDAC XB module that was designed to interface thermocouples and other engine monitoring sensors, which was connected to an Electronic Flight Instrument System (EFIS); and a MGL XL (non-Stratomaster model) EFIS. These units were sent to the National Transportation Safety Board Recorders Laboratory for download of non-volatile memory. The last data log retrieved from the Adventure Pilot iFly 720 had a timestamp from October 21, 2017, about 2.5 months before the accident flight. The MGL RDAC XB and MGL XL units did not record data.

The engine, a Jabiru model 2200 (serial number 22A3748), was removed and shipped to Arion Aircraft, Shelbyville, Tennessee, for an engine run under the supervision of an FAA inspector. The inspector stated that the engine started and ran smoothly for about 5 to 10 minutes before the test was discontinued.

Medical and Pathological Information

The Cuyahoga County Medical Examiner's Office, Cleveland, Ohio, performed an autopsy of the pilot. The medical examiner reported the cause of death as blunt impact injuries.

Toxicology testing performed by the FAA Forensic Sciences Laboratory identified Losartan in liver. Testing was negative for ethanol and carbon monoxide.

Losartan is a prescription medication used primarily for the treatment of high blood pressure. It may be used alone or in combination with other antihypertensive agents. It is not considered to be impairing.

Tests and Research

Advisory Circular (AC) 90-109A, Transition to Unfamiliar Aircraft, discusses training and risk mitigation in flying various families of airplanes.

According to a table found in Appendix 2 of the AC, the Titan Tornado II was categorized as a low-inertia and/or high-drag airplane. Appendix 4 of the AC defined low-inertia and/or high-drag airplanes as airplanes that rapidly lose energy (airspeed and/or altitude) when there is a loss or reduction of power.

In addition, Appendix 4 d. Other Hazards, states,

Hazards of low-inertia/high-drag airplanes are not limited to power management issues. While all airplanes experience an increase in stall speed with an increase in load factor, such as during turns, these airplanes may also experience significant airspeed decay with increased load factor. This, coupled with low cruise speed to stall speed margin, make these airplanes particularly susceptible to unintentional stalls.

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Alexander McAninch; Federal Aviation Administration; Cleveland FSDO; North Olmsted, OH
Original Publish Date:	November 6, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=96417